



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/645,790	08/23/2000	Zhen He	10003284-1	3545

22879 7590 04/16/2004

HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER

BRINICH, STEPHEN M

ART UNIT	PAPER NUMBER
----------	--------------

2624

DATE MAILED: 04/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**UNITED STATES DEPARTMENT OF COMMERCE****U.S. Patent and Trademark Office**

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
---------------------------------	-------------	---	---------------------

EXAMINER
----------

ART UNIT	PAPER
----------	-------

4

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

# Office Action Summary

Application No.

09/645,790

Applicant(s)

HE ET AL.

Examiner

Stephen M Brinich

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-25 is/are allowed.
- 6) ☒ Claim(s) 1-3,9-21 and 26-38 is/are rejected.
- 7) ☒ Claim(s) 4-8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

Art Unit: 2624

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1-3, 15, 26, 28-29, 33-34, & 37-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Samworth (5892588).

Re claims 1 & 15, Samworth '588 discloses (column 2, lines 11-27) halftone printing arrangements in which both the density (i.e. dot frequency - column 1, lines 22-25) and the size of halftone dots are modulated.

Re claims 2-3, 26, & 33-34, & 37-38, the density modulation operation of Samworth '588 randomly deletes halftone dots in accordance with a pixel gray level to be reproduced. This inherently modulates the spacing of the remaining dots (the fewer dots, the greater the average spacing) and creates a

Art Unit: 2624

dispersed-dot halftone (the deleted dots, and hence the remaining dots, are selected randomly).

Re claims 28-29, Samworth '588 discloses (column 16-19) the halftoning process as a "computer graphics" (i.e. carried out by some form of "computer" following a program) technique.

3. Claims 1, 9-11, 15-17 & 21, 26, 28-30, & 33-38 are rejected under 35 U.S.C. 102(e) as being anticipated by Morimatsu et al.

Re claims 1 & 15, 26, 33-34, & 37-38, Morimatsu et al. (column 3, line 62 - column 4, line 6) discloses halftone printing arrangements in which both the density (i.e. position distribution) and the size of halftone dots are modulated to produce a dispersed-dot halftone (Figures 5-6).

Re claims 9-11, 16-17, 21, 30, & 35-36, Morimatsu et al. discloses (column 3, line 62 - column 4, line 6) the use of error diffusion halftoning to modulate the dot size and dot density in accordance with the pixel tone level to be reproduced.

Re claims 28-29, Morimatsu et al. discloses the use of calculation in the density and size modulations. A device capable of calculation is readable upon a (not further specified) "computer", and is inherently following some calculation algorithm ("program").

Art Unit: 2624

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 18, 20, & 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Samworth (5892588) or Morimatsu et al.

Re claims 18 & 20, Samworth '588 or Morimatsu et al. does not disclose expressly the use of a look-up table to calculate dot density and dot size parameters.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a look-up table to obtain a known function of a given input value.

The suggestion/motivation for doing so would have been to minimize the amount of mathematical processing required to compute a function, by computing the function of each anticipated input value once and storing the result.

Therefore, it would have been obvious to combine the use of a look-up table with Samworth (5892588) or Morimatsu et al. to obtain the invention as specified in claims 18 & 20.

Art Unit: 2624

Re claim 31, Samworth '588 or Morimatsu et al. does not disclose expressly the use of a microprocessor to calculate dot density and dot size parameters.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a microprocessor as the calculation means to execute the dot size and density parameter calculations.

The suggestion/motivation for doing so would have been to perform a known mathematical calculation with standard "off the shelf" hardware.

Therefore, it would have been obvious to combine the use of a microprocessor with Samworth '588 or Morimatsu et al. to obtain the invention as specified in claim 31.

6. Claims 12-14, 19, 27, & 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Samworth (5892588) or Morimatsu et al. in view of De Maio.

As noted above, Samworth (5892588) or Morimatsu et al. discloses halftone printing arrangements in which both the density and the size of halftone dots are modulated.

Re claims 12-14, 19, 27, & 32, Samworth '588 or Morimatsu et al. does not disclose expressly the use of an electrophotographic printer in which halftone dot sizes and positions are set by pulse width modulation.

Art Unit: 2624

De Maio discloses (Abstract) an electrophotographic printer in which pulse width modulation is used to set halftone dots on a printer medium.

Samworth '588 or Morimatsu et al. and De Maio are combinable because they are from the printer field.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the De Maio printer to output the result of Samworth '588 or Morimatsu et al. halftone processing.

The suggestion/motivation for doing so would have been to generate an image hard copy using an electrophotographic printer.

Therefore, it would have been obvious to combine De Maio with Samworth '588 or Morimatsu et al. to obtain the invention as specified in claims 12-14, 19, 27, & 32.

***Allowable Subject Matter***

7. Claims 22-25 are allowed.

8. Claims 4-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:



Art Unit: 2624

Re claim 4 (and dependent claims 5-8), the art of record does not teach or suggest a dot size modulation in accordance with the dot size and dot position of halftone dots that have been subjected to concurrent size and density modulation.

Re claim 22 (and dependent claims 23-25), the art of record does not teach or suggest the printing of a test page showing combined dot size halftone modulation and dot density halftone modulation, the measurement of output absorptance and print distortion values for each combination, the determining of a print distortion for each output absorptance value, and the construction of dot size and dot density look-up tables in accordance with the determined print distortion for each output absorptance value.

#### **Conclusion**

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Venkateswar et al. (column 3, lines 39-42), Samworth (6445465) (column 2, lines 20-32), and Tsuchiya (Abstract) each disclose halftone printing arrangements in which both the density and the size of halftone dots are modulated.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen


Art Unit: 2624

M. Brinich at 703-305-4390. The examiner can normally be reached on weekdays 7:00-4:30, alternate Fridays off.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center 2600 Customer Service center at 703-306-0377.

If attempts to contact the examiner and the Customer Service Center are unsuccessful, supervisor David Moore can be contacted at 703-308-7452.

Faxes pertaining to this application should be directed to the Tech Center 2600 official fax number, which is 703-872-9306.

  
Stephen M Brinich  
Examiner  
Art Unit 2624

smb  
April 15, 2004